

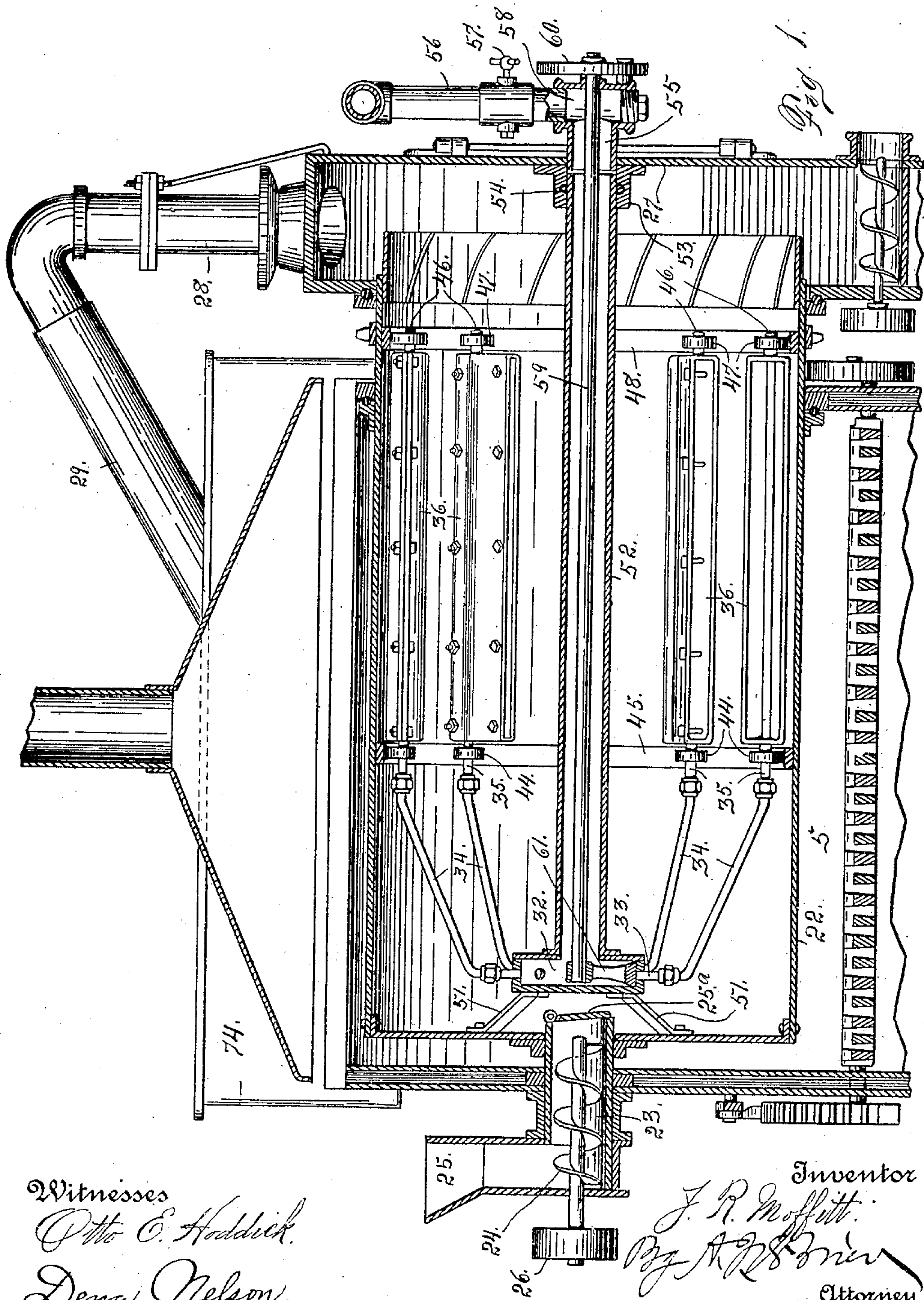
No. 882,073.

PATENTED MAR. 17, 1908.

J. R. MOFFITT.
FUME CONDENSING APPARATUS.

APPLICATION FILED JAN. 16, 1906.

3 SHEETS—SHEET 1.



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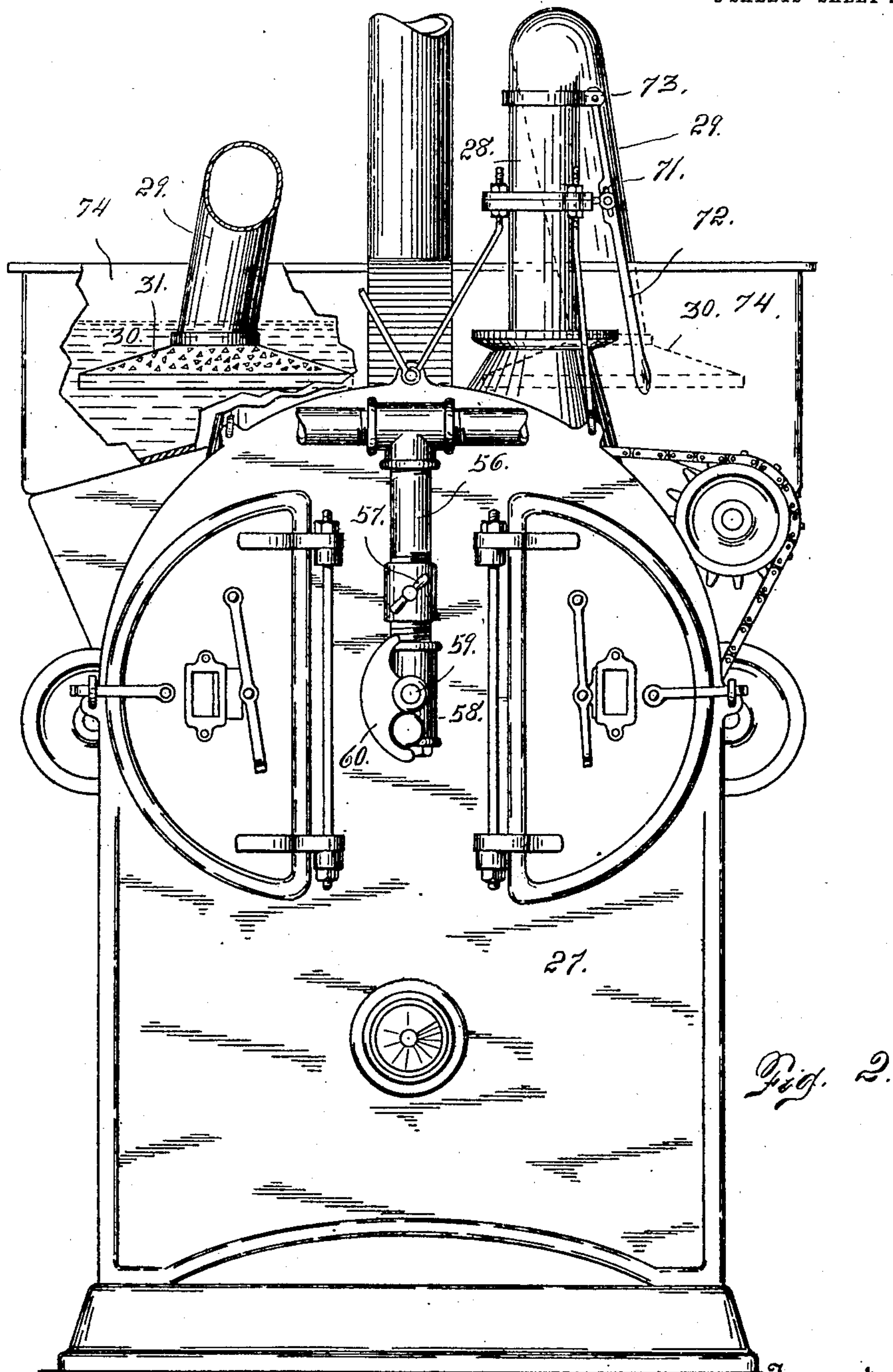


Fig. 2.

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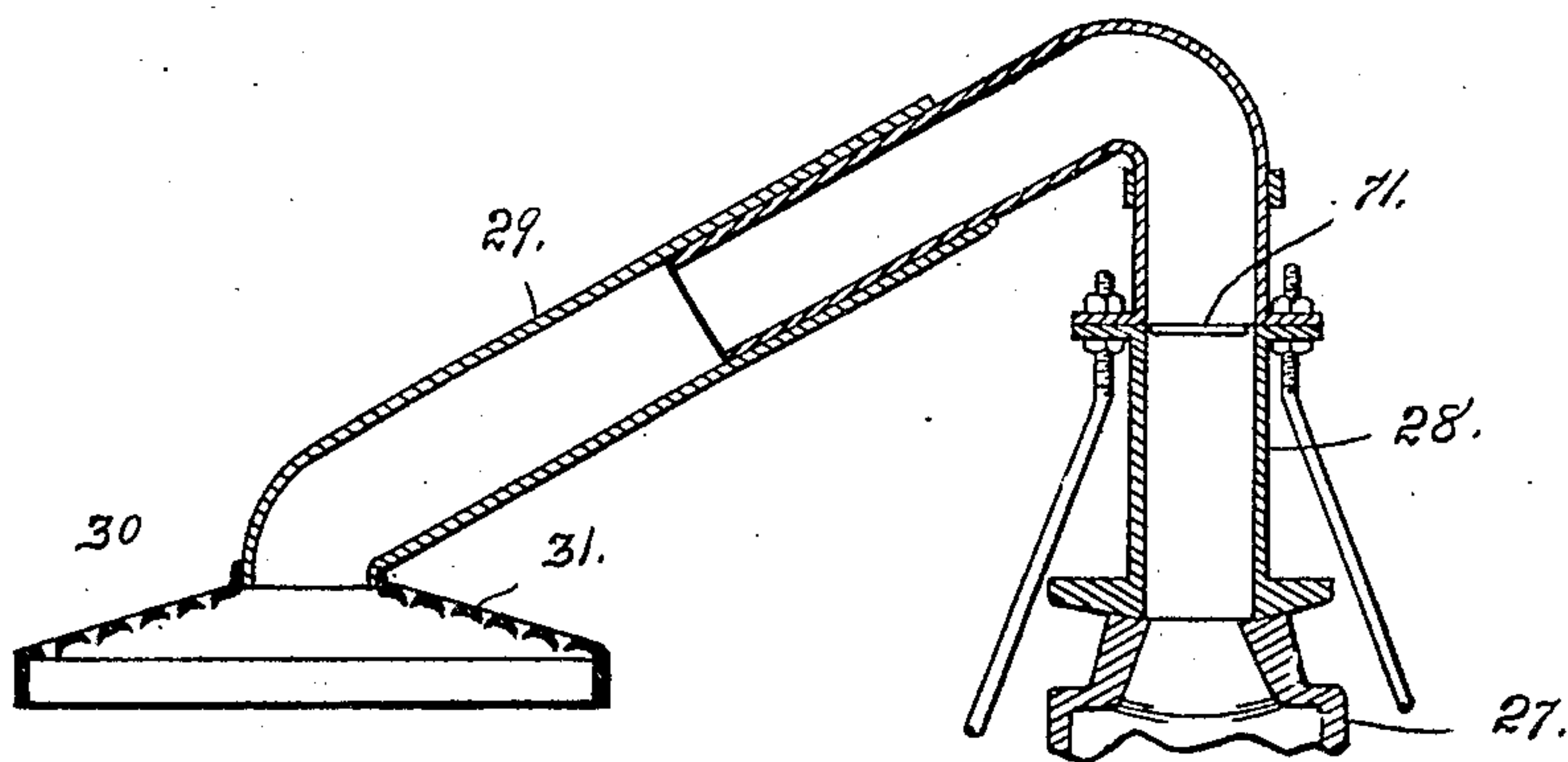


Fig. 3.

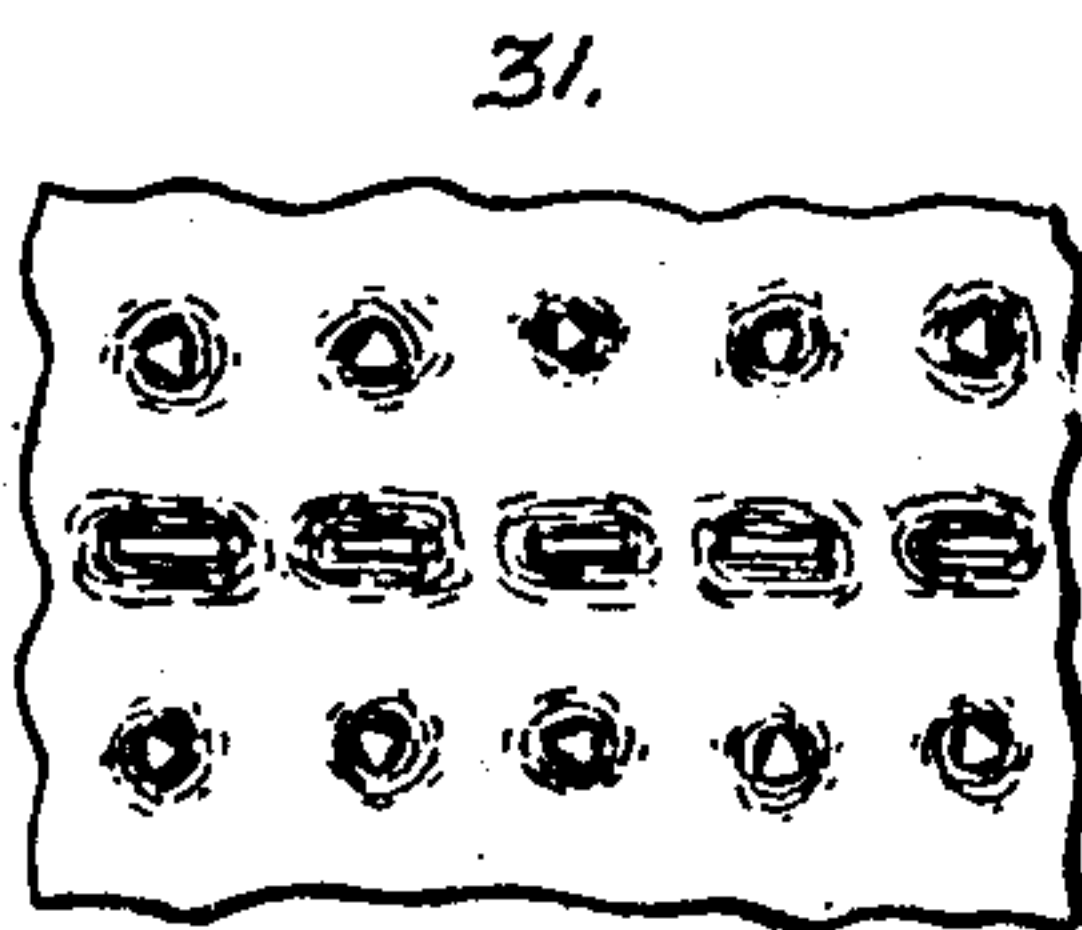


Fig. 4.



Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN R. MOFFITT, OF DENVER, COLORADO.

FUME-CONDENSING APPARATUS.

No. 882,073.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed January 16, 1906. Serial No. 296,390.

To all whom it may concern:

Be it known that I, JOHN R. MOFFITT, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented a certain new and useful Fume-Condensing Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to a process of treating fumes from roasting, smelting or other furnaces in which ore is treated for the purpose of removing the volatile products. The removal of these products is necessary in many cases in order that the ore may be successfully treated for the purpose of saving its metallic values. During the roasting operation of the ores as well as during the operation of smelting ores, an important portion of the values of the ores some times passes off in volatile form.

The object of my invention is to condense these values as well as the volatile impurities. The removal of the impurities from the fumes is a highly important feature of my process from a sanitary standpoint. It is well known that the fumes from smelters and other ore treating plants of the character heretofore indicated, render the atmosphere not only in the immediate neighborhood but some times for miles around, so impure that vegetation is not only destroyed, but the region is rendered practically uninhabitable for people or animals, thus making the plant a nuisance. I have found by actual practice that my improved process removes all of the poisonous elements of these fumes. It is well known that sulfur in large quantities is removed by roasting certain classes of ores. This sulfur in itself is not unhealthy and it is not the object of my process to remove it. My object, however, is to condense and separate the poisonous elements from the sulfur allowing the latter to escape. The sulfur in itself is not only not unhealthy but it is in reality a curative remedy and its escape from plants of this character is in any event not objectionable.

While as heretofore indicated my improved process may be used in connection with all plants of the character indicated

regardless of their special construction, I have shown in the accompanying drawing a condensing apparatus connected with my construction of rotary retort furnace set forth in a simultaneously pending application, Serial No. 296,389, filed Jan. 16th, 1906.

In carrying out my process, the fumes are taken from the chamber where they are volatilized, and conducted to a hood located at the extremity of the conduit, the hood being immersed in water or other liquid. The top of this hood is perforated, the holes being formed by punching the metal inwardly producing a jagged inner surface. As the fumes enter this hood, they are compelled to travel along this jagged surface whereby they are broken up, separated or disintegrated in such a manner as to cause a thorough and even distribution of the volatile products through the liquid, thus resulting in thorough condensation of all condensable elements.

The process therefore broadly stated consists in introducing the fumes into a liquid in distributed volume and in such a manner that the volatile products are separated or broken up to the maximum degree.

In the accompanying drawing, Figure 1 is a longitudinal section of a furnace shown in connection with an apparatus for practicing my improved process. Fig. 2 is an end elevation of the furnace looking from a point at the right of Fig. 1, the construction being partly broken away. Fig. 3 is a detail view of a fume conduit and a condensing hood. Fig. 4 is a fragmentary view of a perforated portion of the hood viewed from the inside. Fig. 5 is a sectional view of the same. Figs. 4 and 5 are shown on a larger scale than Fig. 3.

In this drawing the numeral 5 designates a combustion chamber in which is mounted a revoluble retort 22. This retort is journaled upon a conduit 23 containing a feed screw 24 to which the material to be treated is fed from a hopper 25. The outer extremity of the feed screw shaft is provided with an outer pulley 26. The inner extremity of the feed screw casing is provided with a hinged closure 25^a. The rear extremity of the retort is journaled in a housing 27 located at the rear extremity of the furnace and into which the retort protrudes. This housing communicates at the top with fume conduits 28 which extend upwardly and then downwardly telescoping in a member 29 provided

at its lower extremity with a hood 30 which is open at the bottom but provided with perforated upper walls 31, these perforations being formed by punching whereby the metal forced out of the openings is pushed inwardly forming a rough jagged surface for the hood. This rough and jagged surface together with the perforations, performs an important function in the condensation of the fumes since the latter are strained and disintegrated so to speak, so that when they pass through the hood into the liquid, they are separated or thoroughly distributed, with the result that all the condensable elements are removed, allowing practically nothing but the pure sulfur fumes to escape.

To the forward end of the retort immediately in the rear of the door 25^a of the feed screw casing, is located an air chamber 32 provided with openings into which are screwed nozzles 33 communicating with conduits 34 terminating in members 35 connected with the forward extremities of the rabble troughs 36 mounted near the inner wall of the furnace and longitudinally disposed therein. The troughs are supported at their forward extremities by tubular members 35 which pass through apertured lugs 44 formed on a band 45 secured to the inner wall of the retort. The rear extremities of the troughs are provided with projections 46 which pass through apertured lugs 47 mounted on a band 48 secured to the inner wall of the retort.

The air chamber 32 is connected with the forward extremity of the retort by a number of arms 51 which hold the air chamber suspended. With this chamber is connected the forward extremity of a conduit 52 which is longitudinally disposed and whose axis coincides with the axis of the retort. This conduit protrudes from the retort at its rear extremity and engages a bearing 53 attached to the rear wall of the housing 27. This bearing is provided with a packing 54 of asbestos or other suitable material forming an air joint around the conduit. The housing or rear extremity of the outer wall of the furnace is provided with an opening which is entered by a stationary inlet 55, communicating with an air pipe 56 in which is located

a controlling valve 57. The rear extremity of the inlet 55 is closed at the rear as shown at 58 and through the closure passes a rod 59 provided with an exposed member 60. The rod 59 forms the stem of a valve 61 located in the air chamber, the valve being of the same shape as the exposed member 60. This valve is of sufficient size to close the orifice of the air chamber communicating with a number of conduits 34. As heretofore intimated it is not necessary that air should be delivered to the troughs of the retort except when the troughs contain ore. Therefore the valve is of sufficient size to close the orifices leading to the troughs on the downwardly moving side of the retort. The fume conduits 28 are provided with dampers 71 operated by levers 72 fulcrumed as shown at 73.

As shown in the drawing there are two liquid-containing tanks 74 in which the hoods 30 with the fume conduits are immersed. There may of course be as many liquid-containing tanks and as many hoods as desired.

Having thus described my invention, what I claim is:

1. The combination with a furnace for treating ore by subjecting the latter to the necessary heat to volatilize certain of the elements therein, of a conduit leading therefrom for the passage of the volatilized products or fumes, a hood connected with said conduit and having walls downwardly inclined from said conduit and perforated to form a rough or jagged interior surface, and a liquid-containing tank in which the hood is immersed.

2. As an improved article of manufacture, a fume conduit provided with a hood or enlargement at the exit extremity of the conduit, the said hood having downwardly inclined walls from the conduit, provided with perforations formed by punching the metal inwardly to produce a rough or jagged interior surface.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN R. MOFFITT.

Witnesses:

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A. J. O'BRIEN.